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Parenthood, child care, and nonstandard work schedules in Europe

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Abstract
An increasing proportion of the European labor force works in the evening, at night or on weekends. Because nonstandard work schedules are associated with a number of negative outcomes for families and children, parents may seek to avoid such schedules. However, for parents with insufficient access to formal child care, working nonstandard hours or days may be an adaptive strategy used to manage child-care needs. It enables 'split-shift' parenting, where parents work alternate schedules, allowing one of the two to be at home looking after the children. This study examines the prevalence of nonstandard work schedules among parents and nonparents in 22 European countries. Specifically, we ask whether the provision of formal child care influences the extent to which parents of preschool-aged children work nonstandard schedules. Using data from the European Social Survey and multilevel models, we find evidence that the availability of formal child care reduces nonstandard work among parents. This indicates that access to formal child care enables parents to work standard schedules. To the extent that nonstandard work schedules are negatively associated with child wellbeing, access to formal child care protects children from the adverse effects of their parents' evening and night work.

Keywords
Nonstandard schedules; parenthood; child care

1. Introduction

Parents' employment behavior has been the focus of a great deal of research. As exemplified by the discussion of 'overworked families' (Jacobs and Gerson 2001), the number of hours that parents work has been of particular interest. By contrast, only recently have scholars begun to study parents' scheduling of paid work and the consequences of nonstandard work schedules for families and children (Presser 2003; Han 2008; Täht 2011; Täht and Mills 2012; van Klaveren et al. 2013; Li et al. 2014).

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Nonstandard work schedules – that is, work outside the typical Monday to Friday, nine-to-five schedule – can have negative consequences for child well-being. A large body of evidence showed that work during evenings, nights and on weekends is stressful and can affect workers' involvement in family life and responsiveness to children. For instance, parents working nonstandard schedules reported more depressive symptoms, less effective parenting and worse family functioning (Strazdins et al. 2004). As a consequence, nonstandard work schedules are related to lower levels of children's health and well-being. In comparison to children in families where neither parent works nonstandard hours, young children in families where one or both parents work nonstandard hours have more social and emotional difficulties (Strazdins et al. 2004), higher levels of externalizing and internalizing problems (Han 2008; Daniel et al. 2009), and lower levels of cognitive development (Han 2005; Han and Fox 2011). These studies also showed that the association between parents' work schedules and child well-being persists after adjustment for socioeconomic class (Strazdins et al. 2004), education (Han 2005; Han and Fox 2011), occupation (Han 2005, 2008; Han and Fox 2011) and patterns of child care (Strazdins et al. 2004; Han 2005).

In all, the negative association between parents' works schedules and child well-being suggests that parents should avoid nonstandard schedules in order to prevent their children from experiencing such adverse consequences. However, parents with insufficient access to formal child care may work in the evening, at night, or on weekends as a means of meeting child-care needs, enabling 'split-shift' (Presser 2003) or 'tag-team' parenting (Hattery 2001). These terms refer to situations in which parents work alternate shifts to ensure that at least one parent is available to provide child care.

In this study, we examine the prevalence of nonstandard schedules among parents and childless couples in 22 European countries. Specifically, we ask whether the provision of formal child care influences the extent to which parents of preschoolers are drawn into nonstandard schedules. Although the impact of child care on maternal labor force participation and on the number of hours worked has been studied intensively (Pettit and Hook 2005, 2009; Uunk et al. 2005), previous research has paid little attention to the effect of formal child care on the scheduling of these working hours.

Most studies to date on parents' work schedules have focused on the USA (Presser 2003; Han 2004; Wight et al. 2008), while European research on nonstandard work schedules is still rare and inconclusive. However,

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European Societies, Vol. 18 (2016), Iss. 4, p. 296

the existing research hints at cross-national differences in the association between parenthood and nonstandard work schedules. Studying the association between parenthood and nonstandard work schedules in seven European countries, Presser et al. (2008) found significant effects only in Italy, France and the UK. In a Dutch study, Täht (2011) found that parents were more likely than nonparents to work in the evening or at night, but less likely to work weekends.

The current study sheds new light on nonstandard work schedules of parents by focusing on how access to formal child care moderates the relation between parenthood and work schedules. Given the detrimental effects of nonstandard work schedules on children's emotional, social and behavioral well-being, understanding why parents work nonstandard schedules is crucial for the design of family and educational policies aimed at fostering child development.

2. Formal child care and nonstandard work schedules

The working patterns of families have changed profoundly over the last few decades. With rising female employment rates there has been an overwhelming shift from single- to dual-earner households. Moreover, families today not only work more hours than a few decades ago, but also more often work in the evening, at night or on weekends. Nonstandard work schedules have become a typical characteristic of the '24-7 service economy'. In the European Union, almost 20% of all employees work at night at least once per month. Nearly half of all employees work at least one Saturday per month, and 24% work at least one Sunday per month (Boisard et al. 2003).

Most employees who work nonstandard hours do so because of their job requirements. Nevertheless, as Presser's (2003) study indicates, one out of four employees who works nonstandard hours in the USA does so for personal-familial reasons. This applies particularly to parents of preschoolers. As qualitative studies on the Netherlands (Täht and Mills 2012) and Canada (Pagnan et al. 2011) demonstrate, some parents use nonstandard hours as a strategy to combine paid work and child care. Moreover, recent research has suggested that the availability of formal child care may influence parental work schedules. A study by Felfe (2012) indicates that evening schedules are attractive for mothers of young children in western Germany, where public daycare is limited. Results showed that mothers returned from parental leave sooner if they worked evening schedules and that they were even willing to sacrifice

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European Societies, Vol. 18 (2016), Iss. 4, p. 297

part of their wages to work evenings rather than days. By contrast, evening schedules appeared to be unattractive in eastern Germany, where public child care is widely available.[1] Furthermore, Carriero et al. (2009) conclude from a comparison of Italy, Belgium and the Netherlands that couples tend to synchronize their work schedules if their children are in child care, whereas they tend to split-shift if nonparental child care is unavailable.

Given the arguments and findings reviewed above, we expect that parents will be more likely than childless couples to work nonstandard schedules if they live in countries that offer limited formal child care. But parents in countries where public child care is widely available are expected to avoid nonstandard work schedules.

Furthermore, we assume that couples' decisions about which parent will work nonstandard schedules are gendered decisions. Although the male breadwinner model has eroded over recent years in most western societies, on average, women still adapt their labor market activities to the needs of their children more than men following childbirth (Sanchez and Thomson 1997; Gjerdingen and Center 2005; Craig and Mullan 2010; Kühhirt 2012). Mothers not only interrupt their careers to care for their infants and work reduced hours when their children are small; they also work nonstandard schedules more often than fathers to care for children as they grow up (Presser 2003). We therefore expect that the availability of child care will have a greater impact on mothers' working schedules than on fathers'.

3. Data

The data for our analyses are taken from the European Social Survey (ESS). The ESS is conducted biannually and provides high quality data for cross-national comparisons. The second and fifth ESS round (2004 and 2010) contain questions on respondents' work schedules and the work schedules of respondents' partners. Hence, these two rounds are well suited to addressing the questions raised in this study. As only few persons work nonstandard schedules in some countries, we pool the data from the two waves to increase our sample size. Our sample includes 22 countries (Table 1). The sample is restricted to childless respondents and parents of preschoolers (age 0–5) between the ages 18 and 45. As

[1] The availability of child care still differs between Eastern and Western Germany (Statistisches Bundesamt 2012), especially for children aged 0–2. In 2012, around 50% of Eastern German children aged 0–2 years, but only 22% of their Western German counterparts attended formal child care. Differences are smaller for children aged 3–5 years (94% vs. 88%).

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European Societies, Vol. 18 (2016), Iss. 4, p. 298

split-shift parenting can only occur when both parents work a substantial number of hours, another requirement is that respondents as well as their partners work at least 20 hours per week. The sample includes 2529 men and 2848 women.

Dependent variables: Nonstandard work schedules are measured by two items asking how often respondents work (a) in the evening or at night and (b) on weekends. Respondents provide this information for themselves and for their partners. This study operationalizes the work schedules of individual respondents as well as the schedule arrangements within couples. The frequency of evening/night work is measured in seven categories: never, less than once a month, once a month, several times a month, every week, several times a week and every day. As Presser (2003) argues, indicators for nonstandard work schedules should sharply differentiate people who organize their lives around a nonstandard schedule from people who never or only occasionally work this schedule (see also Presser et al. 2008; Täht 2011). Therefore, in our analysis we use dichotomous indicators for nonstandard schedules rather than the ordinal scale. Respondents are coded as working night or evening shifts if they report working during these hours several times a week or every day. The frequency of weekend work is measured in five categories: never, less than once a month, once a month, several times a month and every week. Respondents are coded as weekend workers if they report working on weekends several times a month or every week. As can be seen in Table 1, the percentage of workers who work several evenings or nights a week ranges from 7% among women in Slovenia to 33% among men in Great Britain. The percentage of workers working Saturdays or Sundays several times a month ranges from 9% among women in Israel to 49% among men in Poland. At the couple level, we distinguish four types of employment arrangements: households where only the woman works a nonstandard schedule, households where only the man works a nonstandard schedule, households where both partners work a nonstandard schedule and households where neither partner works a nonstandard schedule. Descriptive statistics on couples' schedule arrangements are displayed in the Appendix.

Independent micro-level variables: The main explanatory variable at the micro level is a binary variable indicating whether or not respondents live with one or more children aged 0–5 years. Furthermore, the models include extensive control variables. Previous research has shown that the incidence of nonstandard work schedules differs strongly across social class and industrial sectors, as well as by establishment size

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European Societies, Vol. 18 (2016), Iss. 4, p. 300

Table 1. Descriptive statistics by country: work schedules and case numbers by gender, child-care enrolment.

Country	Percentage of evening and night workers in ESS sample[a]		Percentage of weekend workers in ESS sample[b]		Number of cases in ESS sample		Enrolment rates of children aged 0–2 in formal child care in 2008[c]	% employed in the service sector in 2007[d]
	Men	Women	Men	Women	Men	Women		
Austria	18	13	30	21	40	47	12.1	70.5
Belgium	22	20	27	32	156	189	48.4	77.9
Bulgaria	19	17	47	30	36	40	14.6	51.4
Czech Rep.	16	12	42	30	106	102	2.2	58.4
Denmark	17	13	31	25	127	150	65.7	77.0
Estonia	13	22	37	33	70	124	17.5	61.0
Finland	25	20	31	23	167	184	28.6	69.5
France	17	17	35	37	142	182	42.0	77.0
Germany	14	13	32	31	133	144	17.8	72.9
Great Britain	33*	20	44	35	138	165	40.8	80.8
Greece	20*	9	46	40	98	159	15.7	69.2
Ireland	19	14	30	22	132	162	30.8	68.1
Israel	16	22	32*	9	73	93	23.0	78.0
Luxembourg	13	10	37	26	84	69	38.6	75.8
Netherlands	16*	8	3*	19	173	179	55.9	80.4
Norway	22	24	26	25	196	164	51.3	76.0
Poland	19	21	49	45	122	116	7.9	54.5
Portugal	13	11	31	24	95	125	47.4	60.3
Slovakia	14	15	45	38	22	26	3.0	62.3
Slovenia	19*	7	38*	22	58	81	33.8	57.0
Spain	21*	11	32	33	146	150	37.5	68.5
Sweden	24	23	26	28	214	196	46.7	75.5

Switzerland, Russia, Croatia, Ukraine, and Turkey had to be excluded because we lack information on the provision of formal child care in these countries. Furthermore we excluded Cyprus, Hungary, and Iceland because no Hungarian mothers worked nights, no childless Cypriot women worked nights, and all Icelandic fathers worked weekends.

[a]Percentage of workers working evenings or nights several times a week.

[b]Percentage of workers working Saturdays or Sundays several times a month.

[c]OECD (2012).

[d]Unece Statistical Database (data on Israel from 2011).

*Difference between men and women significant at $p < .05$.

(Presser 1995, 2003; Lesnard 2008). We therefore control for social class, distinguishing between higher service class, lower service class, routine non-manual workers, the self-employed, skilled manual workers, unskilled manual workers and farmers, according to the Erikson–Goldthorpe class scheme (Erikson and Goldthorpe 1992). The industrial sector is derived from the NACE (Nomenclature statistique des activités économiques danss la Communauté européenne) classification and distinguishes among the primary sector, manufacturing, producer services, distributive services, personal services and social services. Establishment size is measured by five categories (less than 10, 10–24, 25–99, 100–499 and 500 or more employees). We also control for survey year, age, the number of weekly work hours and education. The measure for education distinguishes among lower education (primary and lower secondary, ISCED 0–2), medium education (upper secondary and post-secondary, ISCED 3–4) and higher education (tertiary, ISCED 5).

It is conceivable that parents' decision to work nonstandard schedules results from their belief that parental child care is superior to center-based care (Täht and Mills 2012). The ESS does not directly ask parents about their child-care preferences, but it does include respondents' level of agreement with the statement 'Women should be prepared to cut down paid work for the sake of the family.' The item is measured on a five-point scale and was recoded so that it ranges from strongly disagree to strongly agree. We use this item as a proxy for parents' child-care preferences, with higher values indicating a preference for parental care.

Macro-level variables: At the macro level, we include a measure of the availability of formal child care. Following current practice (e.g. Pettit and Hook 2005, 2009; Uunk et al. 2005; Budig et al. 2012), the provision of public child care was measured in terms of the percentage of children aged 0–2 years enrolled in formal child care in a given country in 2008.[2] This information was taken from the OECD Family Database (OECD 2012, see Table 1). We used the percentage of children aged 0–2 to construct the child-care indicator because child care for these children is explicitly intended to help families balance care and employment, whereas programs for children aged 3–5 often aim at providing education (see also Misra et al. 2011).[3] Sensitivity analyses that used the availability

[2] We operationalize child-care availability in terms of child-care enrolment rates instead of child-care coverage rates. Arguably, enrolment rates do not fully reflect child-care availability because child-care slots might not be fully utilized. However, we were unable to find comparable cross-national data on child-care coverage for all our countries since international databases (OECD, Eurostat, UNECE) only report child-care enrolment.

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European Societies, Vol. 18 (2016), Iss. 4, p. 301

of child care for children aged 3–5 years produced results very similar to those reported here (the results can be obtained from the authors).

In addition we control for the size of the service sector in 2007 (taken from the UNECE Statistical Database) and the welfare state regime. We distinguish between a social democratic regime (Sweden, Norway, Finland, Denmark and the Netherlands), a conservative regime (Austria, Belgium, Germany, France, Luxembourg), a liberal regime (Ireland, Great Britain), a Mediterranean regime (Spain, Portugal, Greece, Israel) and a post-socialist regime (Poland, Czech Republic, Estonia, Slovakia, Slovenia, Bulgaria).

4. Method

We used two sets of models for our analysis. With the first set of models, we examined for men and women separately whether parents are more likely to work nonstandard schedules than nonparents and how this association is affected by access to formal daycare. To gain further insights into the relation between formal child care and split-shift parenting, we then took a couple perspective in the second set of models. Here, we analyzed whether parenthood affects the likelihood that respondents belong to a couple in which only the woman, only the man, or both partners work a nonstandard schedule rather than a couple in which neither partner works a nonstandard schedule. This perspective allows us to directly identify split-shift arrangements where one partner works a nonstandard schedule while the other does not. However, a shortcoming of this second step is that control variables such as employment sector, establishment size and child-care attitudes are only available for the respondent but not for his or her partner.

Given binary dependent variables, logistic regression models are appropriate for the first step of the analysis. For the second step, we used multinomial logistic regression to capture the four different work arrangements that are possible at the household level. The data structure with respondents nested within countries calls for multilevel analysis (Rabe-Hesketh and Skrondal 2012a, b). Multilevel analysis decomposes the variance of the dependent variable between the country level and the individual level and allows for the inclusion of explanatory variables at the different levels. Furthermore, multilevel models can be specified to allow the effect

[3] We interpret the availability of child care for 0–2 years old as a proxy for child care in general. Countries with generous child-care services for under 3-year-olds usually also offer extensive child care for older children (Pettit and Hook 2005; Steiber and Haas 2009).

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European Societies, Vol. 18 (2016), Iss. 4, p. 302

of children on nonstandard schedules to vary across countries. We can then include cross-level interactions between formal child-care provision and parenthood status to determine whether the effect of children on working nonstandard schedules varies systematically across countries.

Sufficient sample sizes at both the country and individual level are necessary to obtain accurate parameter estimates. As a rule of thumb, Kreft (1996) suggests a minimum of 30 groups with 30 observations per group, whereas Heck and Thomas (2000) suggest a minimum of 20 groups with 30 observations each. Maas and Hox (2005) show the number of observations per group can be even lower: In their simulation study, already a sample of 30 groups with 5 observations led to accurate estimates of the regression coefficients and their standard errors. Hence, according to these studies, our sample size is sufficient.

5. Results

5.1. Descriptive findings

Figure 1 graphically displays bivariate correlations between formal child care and nonstandard schedules. The figure shows how formal child care relates to the difference in the percentage of parents and childless persons working nonstandard schedules. A *y*-value of 0 indicates that parents and childless persons are equally likely to work nonstandard schedules in a given country. Positive (negative) values indicate that parents are more (less) likely than nonparents to work nonstandard schedules. For instance, a value of 0.05 indicates that the percentage of parents working a particular shift is five percentage points higher than the percentage of nonparents working the same shift.

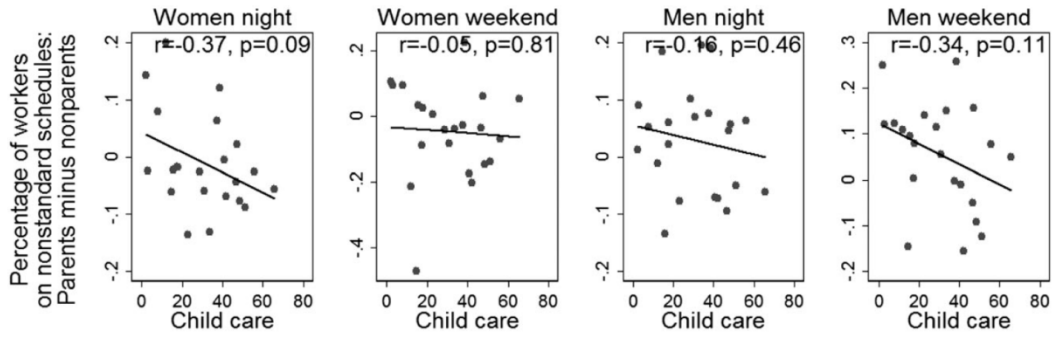

Figure 1. Percentage difference in night work and weekend work between parents and nonparents in the 22 countries by enrolment rates of children aged 0–2 in formal child care.

Originally published in:
European Societies, Vol. 18 (2016), Iss. 4, p. 303

As the negative correlations indicate, parents are more likely than nonparents to work nonstandard schedules when access to formal child care is scarce. But in countries with better access to formal child care, parents become increasingly less likely to work nonstandard schedules. This association scratches statistical significance for night work among women and weekend work among men.

To provide a better picture of the prevalence of split-shifting arrangements of couples, additional analyses take into account information on the work schedule of respondents' partners. Figure 2 provides bivariate correlations between the prevalence of different work arrangements and formal daycare. It distinguishes four shift arrangements: (1) the man works a nonstandard schedule, the woman a standard schedule; (2) the man works a standard schedule, the woman a nonstandard schedule; (3) both work a nonstandard schedule; (4) both work a standard schedule. Each figure depicts the percentage difference between parents and childless couples working in a particular shift arrangement on the *y*-axis and the provision of formal child care on the *x*-axis. Again, when this index takes on the value of 0, parents and childless couples are equally likely to work the arrangement under investigation. Positive (negative) values

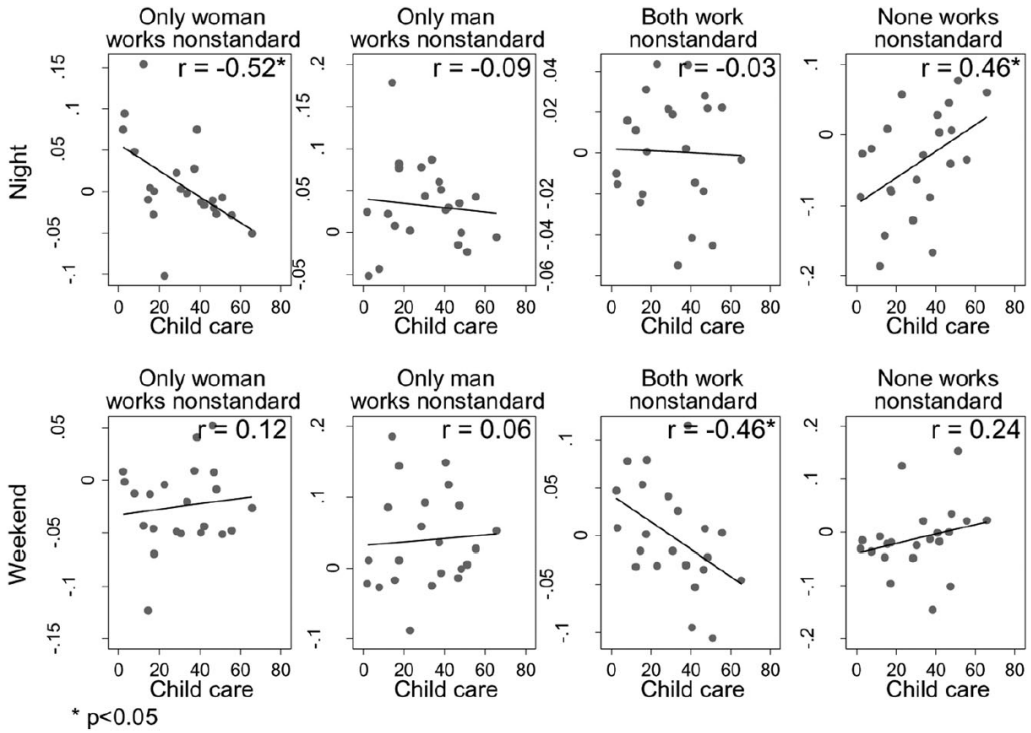

Figure 2. Percentage difference in schedule arrangements between parents and nonparents in the 22 countries by enrolment rates of children aged 0–2 in formal child care.

Originally published in:
European Societies, Vol. 18 (2016), Iss. 4, p. 304

indicate that parents are more (less) likely than childless couples to work in a particular shift arrangement.

The first graph in the upper panel shows a significant negative association between the provision of formal child care and the relative prevalence of split-shift arrangements, where the mother works evenings or nights and the father works standard hours. This supports our assumption that a lack of formal child care draws mothers into such split-shift arrangements in order to provide parental child care. By contrast, the association between formal child care and split-shift arrangements where the father works in the evening or at night is weak. The fourth graph in the upper panel shows that parents in countries where formal child care is widely available are significantly more likely to both work standard hours than parents in countries where formal child care is scarce. This finding provides further support for our hypothesis that inadequate provision of formal child care draws parents into split-shift arrangements. The likelihood that both parents work evenings or nights appears to be unrelated to formal child care.

The graphs in the lower panel of Figure 2 depict the relative prevalence of weekend work among couples with children. Here, the results are less consistent with our hypotheses. As the third and fourth graph in the lower panel indicate, the relative prevalence of arrangements where both parents work weekends decreases significantly when child care is widely available. However, there is no evidence that formal child care is associated with split-shift arrangements where one parent works weekends while the other does not.

5.2. Multivariate findings

Turning to the multivariate analyses, Table 2 presents the results from the multilevel models estimating the association between formal child care and nonstandard schedules. The results support our assumption that a lack of child-care opportunities drives parents into nonstandard schedules. According to the main effects of parenthood – which refer to the situation in a country where little child care is available – mothers work nights more often than childless women, and fathers work weekends more often than childless men. However, as the interaction effects between parenthood and child-care coverage indicate, this only holds for countries where formal child care is scarce. In countries that offer extensive formal child care, the effect of children is reversed. When the provision of formal child care is high, mothers are less likely than childless

Originally published in:
European Societies, Vol. 18 (2016), Iss. 4, p. 305

Table 2. The association between children and formal child care in determining nonstandard work schedules (odds-ratios).

	Women night	Women weekend	Men night	Men weekend
Child	1.78*	1.21	1.42	1.56*
Formal child care	1.00	1.00	1.00	1.01
Child*Formal child care	0.99*	0.99	0.99	0.99*
Child care beliefs	1.00	0.96	0.93	1.03
Education[a]				
Lower education	0.71	0.75^{+}	1.12	1.01
High education	1.01	0.83	1.20	0.85
Social class[b]				
Professionals in higher service class	0.38***	0.27***	0.49**	0.47***
Professionals in lower service class	0.53**	0.41***	0.72	0.52***
Routine non-manual	0.46***	0.45***	0.66	0.57*
Self-employed	1.08	1.05	0.96	1.40
Skilled manual	0.69	1.16	0.78	0.80
Farmers	0.91	1.23	0.62	1.48
Occupational sector[c]				
Primary sector	1.56	4.94***	1.62	3.03***
Distributive services	1.40	5.14***	1.34^{+}	2.11***
Producer services	1.02	1.10	1.30	1.26
Personal services	2.44***	5.97***	4.96***	5.85***
Social services	2.60***	3.78***	2.55***	2.79***
Establishment size[d]				
<10 Employees	0.93	1.22	1.31	1.31^{+}
10–24 Employees	1.00	0.88	1.12	0.88
25–99 Employees	1.15	0.98	1.30	1.06
100–499 Employees	1.08	0.99	1.33	1.11
Work hours	1.04***	1.05***	1.07***	1.07***
Age	0.99	0.98**	0.98^{+}	0.99
Welfare state regime[e]				
Social democratic	1.31	0.75	1.51*	0.90
Liberal	1.19	0.97	1.74*	1.22
Mediterranean	0.81	0.73	0.78	0.86
Post-socialist	1.15	1.17	0.70	1.37
Size of the service sector	1.02	1.01	0.99	1.01
Survey year 2010	1.05	1.04	1.01	1.02
Constant	0.01**	0.04*	0.01***	0.01***
Random components				
Variance country intercept	0.09	0.07	0.06	0.00
Variance child slope	0.00	0.00	0.06	0.00
Covariance intercept*Slope	−0.02	−0.01	−0.06	0.00
Log likelihood	−1159.84	−1456.69	−1107.50	−1376.43

[a]Reference group: medium education.
[b]Reference group: unskilled manual.
[c]Reference group: manufacturing.
[d]Reference group: >500 employees.
[e]Reference group: conservative.
*$p < .05$.
**$p < .01$.
***$p < .001$.
$^{+}p < .1$.

women to work evenings or nights and fathers are less likely than childless men to work weekends.

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European Societies, Vol. 18 (2016), Iss. 4, p. 306

As interaction effects are difficult to interpret, we calculated the predicted marginal probabilities for the incidence of nonstandard schedules among parents and nonparents in countries with low and high childcare enrolment rates. These probabilities illustrate that the impact of formal child care is substantial. When a country shows a very low rate of enrolment in formal child care (e.g. 2% in the Czech Republic), mothers are seven percentage points more likely than childless women to work evenings or nights. By contrast, when the majority of children are in formal child care (e.g. 66% in Denmark), mothers are four percentage points less likely than childless women to work in the evening or at night. Likewise, fathers are nine percentage points more likely than childless men to work weekends when formal child care is limited, but six percentage points less likely to work weekends when formal child care is widely available.

Concerning gender differences, the results for evening and night work are in line with previous research (Presser 1995; Hamermesh 1996) as they indicate that mothers are more prone to adapt their work schedules to child-care needs than fathers. The opposite appears to be the case for weekend work. Here, fathers appear more likely to adapt their schedules to child-care needs than mothers.

In the next step, we turn to the analysis of the effect of child-care coverage on couples' work schedule arrangements. Table 3 presents relative risk ratios from multinomial logistic regression contrasting the likelihood that only the man, only the woman, or both partners in a couple work nonstandard schedules compared to the likelihood that neither partner works a nonstandard schedule (reference group). These results generally align with the bivariate results shown in Figure 2. In countries with little formal child care, the relative risk of a split-shift arrangement where the woman works in the evening or at night and the man works a standard schedule is greater for parents than for nonparents. By contrast, in countries with sufficient formal daycare, this split-shift arrangement is less likely for parents than for nonparents compared to an arrangement where both partners work a standard schedule. This finding provides further evidence that mothers tend to work nights for child-care reasons when formal child care is unavailable. However, formal child care does not affect the relative risk that both parents or only the father works evenings or nights.

Regarding weekend work, we find no evidence that formal child care is associated with split-shift arrangements where one parent works weekends and the other does not. But the likelihood that both parents work

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European Societies, Vol. 18 (2016), Iss. 4, p. 307

Table 3. Relative risk ratios from multinomial logistic regression contrasting four schedule arrangements within the couple.

	Evening and night work[a]			Weekend work[b]		
	Only the man	Only the woman	Both partners	Only the man	Only the woman	Both partners
Child	1.33	2.50***	1.29	1.26	0.93	1.56*
Child care	0.99	1.00	0.99	1.00	1.00	1.00
Child*Child care	0.99	0.98**	0.99	1.00	1.00	0.99*
Constant	0.02***	0.04***	0.00***	0.04**	0.05*	0.01***
Random components						
Variance country intercept	0.11			0.03		
Variance child slope		0.04			0.01	
Covariance intercept*Slope	−0.06			0.01		
Log likelihood		−4199.21			−5746.46	

[a]Reference category is: neither partner works evenings or nights.
[b]Reference category is: neither partner works weekends. All models control for welfare state regime, size of the service sector, survey year and both partners' education, occupation, work hours and age.
*$p < .05$.
**$p < .01$.
***$p < .001$.
+$p < .1$.

weekends is lower in countries where many young children attend daycare than in countries where few children attend daycare. This provides some evidence for the hypothesis that both parents can work during standard weekdays when extensive formal daycare is available. The fact that both parents are particularly likely to work weekends when public child care is limited may reflect a split-shift arrangement with one partner working on Saturdays and the other on Sundays.

6. Discussion

A substantial proportion of the workforce works in the evening, at night or on weekends. Because nonstandard schedules are associated with a number of negative outcomes for the individual workers and their families (Li et al. 2014), parents may seek to avoid such schedules. However, when parents do not have access to formal daycare, working alternate schedules with one partner on a nonstandard schedule may be the only option allowing both parents to be gainfully employed. In this study, we asked whether insufficient provision of formal child care draws parents into nonstandard work schedules.

We found that access to formal child care is strongly related to the likelihood that mothers work in the evening or at night. The more formal child care was available in a country, the less likely mothers were to

Originally published in:
European Societies, Vol. 18 (2016), Iss. 4, p. 308

work evenings or nights compared to childless women. Taking a household perspective and studying the work schedules of both partners jointly provided further support for these findings. Split-shift arrangements where the mother worked nonstandard hours and the father worked standard hours were particularly likely in countries where access to formal child care was low. High child-care enrolment rates, by contrast, were associated with work arrangements where both parents worked during the day.

The findings for weekend work were more ambiguous. We found that fathers were more likely than childless men to work weekend schedules if they lived in countries with a low supply of formal daycare, but they were less likely than childless men to work weekends if they lived in countries with a high supply of formal daycare. The couple-level analysis, however, did not support the assumption that parents use split-shifting on weekends for child-care reasons. Nevertheless, arrangements where both parents work weekends were less likely in countries where extensive formal child care was available. The overall findings are in line with previous research indicating that parents work at nights more often than on weekends because of child-care reasons (Presser 1995; Täht 2011).

Our findings shed new light on the association between child-care choices and schedules worked. Apparently, the provision of child care does not only directly benefit children's well-being (as shown, for example, by NICHD 2002; Hansen and Hawkes 2009), but also indirectly: As our study showed, insufficient provision of formal child care induces parents to work nonstandard schedules, which decreases time spent together as a family, reduces parenting quality, and jeopardizes children's cognitive development and mental health.

Concerning gender differences, the findings for evening and night work add to previous research showing that mothers rather than fathers adapt their work schedules to child-care needs (Sanchez and Thomson 1997; Gjerdingen and Center 2005; Craig and Mullan 2010; Kuhhirt 2012). Apparently, mothers not only interrupt their careers and reduce their working hours when they have children, but also often switch to evening and night shifts to better combine child care and paid work. By contrast, fathers do not seem to work evening or night shifts to meet child-care needs. However, we find a surprisingly strong association between formal child-care provision in a country and weekend work among fathers.

Some limitations to our study should be noted. Our analysis utilized cross-sectional data. Consequently, the question of causality remains a

Originally published in:
European Societies, Vol. 18 (2016), Iss. 4, p. 309

legitimate concern. Theoretical reasoning and the empirical findings presented here suggest that the provision of child care within a country affects parents' choice to work nonstandard schedules. Nevertheless, causality may also run in the reverse direction. As a study by Han (2004) indicates, parents often change their child-care arrangements when mothers stop or begin working nonstandard schedules. Although it seems unlikely that parents' choice of work schedules influences the national child-care enrolment rates, the cross-sectional nature of our data does not allow us to disentangle these two effects.

Moreover, quantitative surveys usually provide some information about respondents' work behavior, but little insight into their motives or how couples make their decisions around work and child care. Consequently, our study provides no information about whether parents who work nonstandard schedules do so due to a lack of child-care opportunities or due to job requirements. Qualitative studies on nonstandard schedules – which are still rare – might shed more light on the question of why parents work nonstandard schedules and how they make such decisions.

Irrespective of these shortcomings, the current study provides new and valuable insights into cross-national differences in nonstandard schedules among parents. In particular, it highlights an additional beneficial aspect of formal child care: Formal child care not only facilitates maternal employment and positively affects children's cognitive development, it also enables parents to work standard schedules and thus protects parents and children from the adverse effects of evening and night work.

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Originally published in:
European Societies, Vol. 18 (2016), Iss. 4, p. 313

Appendix. Descriptive statistics of couples' schedule arrangements

Country	Evening/night work			Weekend work		
	Only the man (%)	Only the woman (%)	Both (%)	Only the man (%)	Only the woman (%)	Both (%)
Austria	17*	7	1	26*	8	11
Belgium	19*	13	4	17	18	14
Bulgaria	12	7	5	23*	4	22
Czech Rep.	14*	7	1	25*	13	13
Denmark	15*	9	2	22	16	9
Estonia	13	16	4	22	20	15
Finland	18	16	5	17	19	11
France	11	11	4	19	23	14
Germany	12	8	3	17	13	16
Great Britain	17	13	9	25	18	18
Greece	13*	5	3	20*	11	25
Ireland	13	8	6	20*	11	11
Israel	17*	8	7	22*	7	4
Luxembourg	7	7	4	21*	12	11
Netherlands	11*	7	2	17	13	8
Norway	14	16	6	15	16	9
Poland	13	11	6	24*	15	9
Portugal	11	7	3	21*	9	12
Slovakia	15	9	2	21	11	28
Slovenia	13*	4	3	32*	12	9
Spain	13*	16	4	22	16	15
Sweden	15	15	5	14	17	10

*Difference between couples where only the man works a nonstandard schedule and couples where only the woman works a nonstandard schedule significant at $p < .05$.

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